South Carolina

Enterprise Architecture

Software Development

Vendor Standards Policy

v2.0 - September 6, 2006

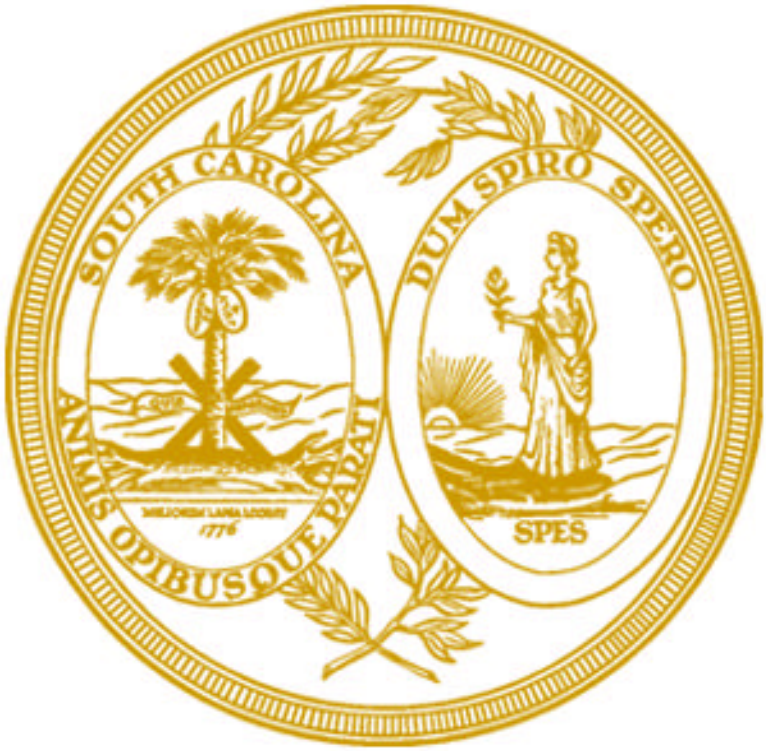

Table of Contents

1.0 Introduction

1.1 Authority

The State Budget and Control Board is authorized to undertake the development of enterprise architecture policies and standards as set forth in **Section 11-35-1580** of the *South Carolina Consolidated Procurement Code*. This Section states, in part, that the State Budget and Control Board shall be responsible for:

a. Assessing the need for and use of information technology;

b. Administering all procurement and contracting activities undertaken for governmental bodies involving information technology in accordance with this chapter;

c. Providing for the disposal of all information technology property surplus to the needs of a using agency;

d. Evaluating the use and management of information technology;

e. Operating a comprehensive inventory and accounting reporting system for information technology;

f. Developing policies and standards for the management of information technology in state government;

g. Initiating a state plan for the management and use of information technology;

h. Providing management and technical assistance to state agencies in using information technology; and

i. Establishing a referral service for state agencies seeking technical assistance or information technology services.

The State Budget and Control Board has delegated this authority to the Division of the State CIO. Based upon this authority, the Division of the State CIO has established the SC Enterprise Architecture to conduct operations and take actions to fulfill this mandate.

1.2 Purpose

To establish an effective means to consistently acquire high quality software development and integration services.

1.3 Scope

This policy applies to software development and integration projects having a cumulative investment of $50,000 or more. Software includes both systems software and applications software.

1.4 Background

Recently, several standards and methodologies have been created to increase an organization's ability to manage the consistent development of high-quality products and services. For example, the International Organization for Standards (ISO), working with representatives from worldwide industry and governments, developed the *ISO 9001: Quality Management System* standard to address generic continuous process improvement (CPI) and capabilities assessment.

Moreover, Carnegie-Melon's Software Engineering Institute (SEI), funded by the Department of Defense (DoD), developed the *Capability Maturity Model Integration* (CMMI) methodology to address software specific CPI and assessment.

Both are now considered to be best-in-class by industry experts such as Gartner.

1.5 Definitions

CPI: Refers to Continuous Process Improvement, which is an approach whose purpose is to constantly better quality and productivity, et al.

Development: Software Development is the discipline of designing, creating, and maintaining software by applying specific methodologies.

Integration: For the purposes of this policy, refers to the process of implementing or combining information technologies.

ISO: Refers to the International Organization for Standards, which is an international standards group composed of representatives from national standards groups from around the world.

SEI: Refers to Carnegie-Mellon's Software Engineering Institute, which is a federally funded research and development center operated by Carnegie-Mellon University.

SCAMPI? : Refers to the SEI's formal appraisal process - Standard CMMI Appraisal Method for Process Improvement.

Software: For the purposes of this policy, software includes both system software and applications software.

2.0 Policy

2.1 General

It is voluntary for vendors to utilize such standards and methodologies; however, compliance does signify a greater level of effort to perform software development and integration activities in a repeatable and consistent high quality manner. To that end, effective July 1, 2006, all agencies soliciting the services of a third party to develop and/or integrate software for a Major, Multi-Agency, or Enterprise project (as defined in the State CIO's *Policy for the Management of Technology Projects*) must request and evaluate potential vendors in the following manner:

- ✓ A request for a list of ISO 9001 and/or CMMI certifications, including last certification date, certification level (if CMMI), and the certifying (auditing) party shall be included in the solicitation document as an independent provision.

- ✓ The process established by an agency to evaluate responses shall provide additional independent points to vendors demonstrating ISO 9001 and/or CMMI certification. It is recommended that points be awarded in graduated magnitudes as follows:

CMMI Level 1	=	0%	CMMI Level 3	=	60%
CMMI Level 2	=	20%	CMMI Level 4	=	80%
ISO 9001	=	40%	CMMI Level 5	=	100%

- ✓ CMMI certifications must meet the following criteria in order to receive points:

  1. Certifications must user the Standard CMMI Appraisal Method for Process Improvement (SCAMPI?).

  2. Certification must be preformed by an SEI certified Lead Appraiser external to the vendor or agency.

  3. Certification may not be older than five (5) years.

  4. Certification must apply to the organization actually performing the work.

Although not required, it is recommended that agencies soliciting the services of a third party to develop and/or integrate software for a Small Technology Project request these same types and levels of certification from vendors. However, any project with a cumulative investment of $1,000,000 or more shall require a minimum of CMMI Level 3 or ISO 9001 certification.

2.2 ISO 9001 Certification Process

There are key steps that every organization implementing a QMS will need to consider:

Step 1: Purchase the Standard
Before you can begin preparing for your application, you will require a copy of the standard. You should read this and make yourself familiar with it.

Step 2: Review support literature and software
There are a wide range of quality publications and software tools designed to help you understand, implement and become registered to a quality management system.

Step 3: Assemble a team and agree on your strategy
You should begin the entire implementation process by preparing your organizational strategy with top management. Responsibility for a QMS lies with Senior Management; therefore it is vital that Senior Management is involved from the beginning of the process.

Step 4: Consider Training
Whether you are the Quality Manager seeking to implement a quality management system or a Senior Manager who would like to increase your general awareness of ISO 9001:2000, there are a range of workshops, seminars and training courses available.

Step 5: Review Consultancy Options
You can receive advice from independent consultants on how best to implement your quality management system. They will have the experience in implementing a QMS and can ensure you avoid costly mistakes.

Step 6: Choose a registrar
The registrar is a 3rd party who assesses the effectiveness of your quality management system, and issue a certificate if it meets the requirements of the standard. Choosing a registrar can be a complex issue as there are so many operating in the market. Factors to consider include industry experience, geographic coverage, price and service level offered. The key is to find the registrar who can best meet your requirements. Small businesses can form consortiums to leverage their collective resources to negotiate costs when contracting a registrar. Remember prices are negotiable.

Step 7: Develop a Quality manual
A Quality manual is a high level document that outlines your intention to operate in a quality manner. It outlines why you are in business, what your intentions are, how you are applying the standard and how your business operates.

Step 8: Develop support documentation

This is typically a procedures manual that supports the Quality manual. Quite simply, it outlines what you do to complete a task. It describes who does what, in what order and to what standard.

Step 9: Implement your Quality Management System
The key to implementation is communication and training. During the implementation phase everyone operates to the procedures and collects records that demonstrate you are doing what you say you are doing.

Step 10: Consider a pre-assessment
A pre-assessment by your registrar normally takes place about 6 weeks into the implementation of the quality system. The purpose of the pre-assessment is to identify areas where you may not be operating to the standard. This allows you to correct any areas of concern you may have before the initial assessment.

Step 11: Gain registration
You should arrange your initial assessment with your registrar. At this point the registrar will review your QMS and determine whether you should be recommended for registration.

Step 12: Continual assessment
Once you have received your registration and been awarded your certificate, you can begin to advertise your success and promote your business. To maintain your registration, all you need to do is continue to use your quality system. This will be periodically checked by your registrar to ensure that your Quality System continues to meet the requirements of the standard.

2.3 CMMI Certification Process

The following actions demonstrate the typical steps involved in implementing CMMI-based process improvement (Note: The steps and sequence may vary from organization to organization.):

Step 1: Secure Sponsorship and Funding
Before you begin your process improvement effort, ensure that your process improvement program has a senior management sponsor and funding. Such sponsorship and funding is critical to ensuring the program's success. You can educate senior management about CMMI by presenting the CMMI v1.1 Overview or CMMI Executive Overview presentations that can be found at http://www.sei.cmu.edu/cmmi/.

Step 2: Take Core Training
To understand basic concepts of the CMMI Product Suite, attend the Introduction to CMMI, Version 1.2 course. This CMMI course is offered by the SEI and by many members of the Software Engineering Institute.

Step 3: Prepare Your Organization for Change
You need to treat process improvement as a project. Establish the business reasons and the business goals for the effort. Create a compelling case for change, including the rationale for the undertaking and the expected benefits and costs for the people affected. Develop a persuasive presentation of the problems and opportunities. Key people involved in your organization's process improvement efforts should also take the Introduction to CMMI, Version 1.2 course.

Step 4: Form an Engineering Process Group
This group coordinates process improvement activities across the enterprise and exists for the duration of the process improvement activity. Members of the group can serve as process improvement mentors. If the Engineering Process Group is new to process improvement, members should consider taking the Defining Software Processes or Mastering Process Improvement courses.

Step 5: Know Where You Are
Map CMMI best practices to your organization's processes and do an informal gap analysis (e.g., SCAMPISM C) to determine how your processes compare to CMMI model practices using an ARC Class C compliant appraisal method. Do a survey to gather data from managers, project leads, and workers to gauge cultural opportunities and barriers to change. Build a detailed picture of the present.

Step 6: Know Where You Are Going
Using the same format as the picture of where you are, create a picture of where you want to be. Characterize the success you want before you begin. Get a balanced view from management, project leaders, and staff about what they think is most important. Each will have different objectives they want to

achieve. Prioritize the process areas to address and build your improvement plan. Track your progress against the plan.

Step 7: Communicate and Coordinate
You must have honest and open communication. Share the plan with everyone who will be affected and listen to their comments.

Step 8: Track Your Progress
Compare the picture of where you are to the one of where you want to be. The difference between the two is the focus of your process improvement program. Create a periodic (e.g., monthly, weekly) report that demonstrates your program's progress in reaching its (and the organization's) goals. You can also have a SEI-authorized lead appraiser conduct an appraisal, which will provide an objective evaluation of your organization using the SCAMPI method and a CMMI model. For more information about SCAMPI, see CMMI Appraisals found at http://www.sei.cmu.edu/cmmi/appraisals/ .